HP Labs, headquartered in Palo Alto, USA, is the corporate research group of Hewlett-Packard (HP), and one of the world's leading industrial research laboratories. HP Labs conducts high-impact scientific research to address the most important challenges and opportunities facing our customers and society in the next decade.

HP Labs' current focus is tackling complex challenges facing our customers and society over the next decade, while pushing the frontiers of fundamental science. Collectively, we are applying our expertise to address the following eight opportunities that we believe are crucial to defining the future of information technology.

- Analytics
- Cloud
- Content Transformation
- Digital Commercial Print
- Immersive Interaction
- Information Management
- Intelligent Infrastructure
- Sustainability

HP Labs India was established in February 2002 with the principal focus on creating new technologies for addressing the IT needs of the next billion customers for HP. A large majority of these new customers arise from rapidly growing markets such as India with distinct technological, social and economic characteristics. HP Labs India uses the understanding of this context and carries out deep technical research that has direct impact on HP's business through innovations in product and service offerings valued by customers.

HP Labs India's current focus is on: "*Enabling rich and intuitive experiences that deliver the value of computing and the internet for non-tech-savvy users*" through technology research and innovation. We provide an excellent opportunity for interns and post-docs to contribute to the ongoing research, working on cutting edge technologies that can have deep impact.

Research Projects

HP Labs India works at the intersection of deep technical research, direct impact on HP's businesses and solving hard and significant customer challenges. We are currently focused on the following research areas that are closely interconnected in end-to-end solutions to develop prototypes and demonstrators.

- **Paper Based Interaction**
- **Intuitive Multimodal and Gestural Interaction**
- **Simplifying Web Access and Interaction**
- **Technology in Education**
- **Device, Connectivity and Cloud Services**

Paper Based Interaction

Paper continues to exist in large volumes inspite of futuristic predictions of a 'paperless world'. The affable nature of paper makes it widely accepted, highly affordable, technology agnostic and unplugged. However, the disconnect between paper and digital systems leads to inefficiencies in small, medium and large enterprises.

This research at HP Labs India aspires to create a unique and novel set of technologies to enable seamless co-existence of paper in a digital world. Both scanner-based and camera-based document capture systems are included in our research.

The research areas relevant to this research include document image analysis and understanding, handwriting recognition, computer vision, pattern recognition, information theory, machine learning and security related to printing.

Intuitive Multimodal and Gestural Interaction

The dexterous human hands have historically driven most input modalities for computer systems, including the dominant keyboard and mouse. However,

with the availability of additional sensors such as touch sensors and cameras, new, more natural input modalities such as pen, touch, and hand gestures are becoming mainstream and redefining human computer interfaces for personal systems.

This research at HP Labs India explores new and compelling user experiences and supporting technologies for personal systems that are natural, context aware, adapt with use and achieve multimodality.

This will draw on new and existing techniques in experience design, user research and ethnography, human computer interaction, image processing, computer vision, pattern recognition, sensor fusion and decision combination.

Simplifying Web Access and Interaction

In emerging markets such as India there is tremendous excitement about the internet. The value of internet for discovering relevant information, efficient ways of carrying out transactions, entertainment, self expression and communication is compelling for non-tech savvy users. While initial barriers to internet consumption - connectivity and affordability, are fast disappearing, a significant issue preventing web consumption today is the complexity of web tools.

This research aims to radically simplify web experiences that will help everyone realize the value of the web. A user's web interactions need to be encapsulated so that the interaction is personally familiar, uncluttered and accessible with minimal effort.

The core areas of research include machine learning, information retrieval, personalization, autonomous agents, semantic web, mobility, web mining and programming language design.

Technology in Education

Technology is playing an increasing role in education around the world. The vast community of educational institutions, teachers and even students are leaders in sharing the resources they create.

They are also leaders in the Web 2.0 effort. The Technology in Education effort carries out research aimed at creating new ideas and techniques for use by this e-Community and enhancing their effectiveness. Our work includes mapping quizzes into competitive games, promoting student collaboration, and harvesting of educational content from student-student interactions.
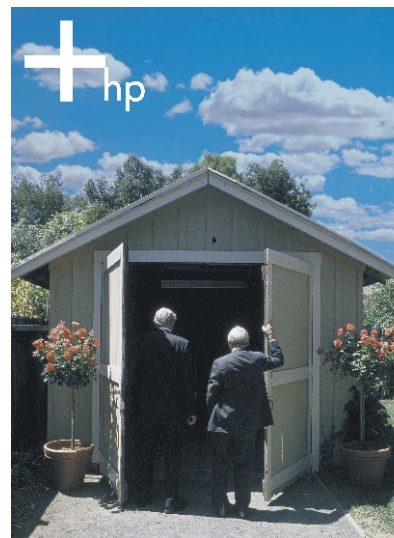
Rules of the garage

Believe you can change the world.
Work quickly, keep the tools unlocked, work whenever.
Know when to work alone and when to work together.
Share tools, ideas. Trust your colleagues.
No Politics. No bureaucracy.
(These are ridiculous in a garage).
The customer defines a job well done.
Radical ideas are not bad ideas.
Invent different ways of working.
Make a contribution every day.
If it doesn't contribute, it doesn't leave the garage.
Believe that together we can do anything.
Invent.

Device, Connectivity and Cloud Services

Any end-to-end solution must take into account the availability of client devices(whether mobile or fixed), how they are interconnected, and what services, content and infrastructure from the cloud can be leveraged to deliver cost-effective, useful and rich experience to the user.

The core areas of research include mobile internet, location-based services, embedded systems, interaction paradigms and mobile caching techniques.

Careers

The work environment at HP Labs India is dynamic and fast-paced. It offers challenging roles for people with technical depth and creativity. The work culture encourages and motivates teamwork, proactiveness and leadership abilities. Other highlights include a cordial and open work atmosphere that facilitates free flow of ideas.

University Relations

HP Labs India has several engagements with the higher education community at the national and international level. Our collaborative work with these institutes takes the form of joint research projects as well as student projects. The collaborations include joint PhD fellowships, sponsored research students and sponsored research projects.

Further details can be found at **www.hpl.hp.com/india**